AU–103

B.Sc. Part–II Semester—III Examination

FORENSIC SCIENCE

(Forensic Physics)

Time : Three Hours] [Maximum Marks : 80

Note :– (1) All questions are compulsory.

(2) Question No. **1** carries **8** marks while each of the remaining questions carries **12** marks.

1. (A) Fill in the blanks :

(i) The firearm in which revolving cylinder is present is known as _____.

(ii) DSLR stands for _____.

(iii) The microscope in which 3D image of object is form is known as _____.

(iv) The Barrel consists of Muzzle and _____ end. 2

(B) Multiple choice questions :

(i) Colour temperature is related with :

(a) ISO number (b) Shutter speed

(c) Aperture (d) White balance

(ii) Which method is used to measure barrel pressure ?

(a) Strain gauge method (b) Displacement method

(c) Borderline method (d) Electrostatic method

(iii) Cryopreservation is reformed at :

(a) – 196°C (b) 196°C

(c) –194°C (d) 194°C

(iv) A laser beam consists of :

(a) Light material particles (b) Highly coherent photons

(c) Electrons (d) Cosmic rays 2

(C) Answer in **one** sentence :

(i) Define metastable state.

(ii) What is crime scene photography ?

(iii) What is barrel pressure ?

(iv) What is microspectrophotometer ? 4

UNIT—I

2. (A) Describe the construction and working of ruby laser. 5

(B) State the medical and chemical applications of laser. 4

(C) Explain Spontaneous emission. 3

OR

3. (P) Describe the structure of optical fiber. 2

(Q) State the applications of optical fiber. 3

(R) How propagation of light takes place in optical fiber ? 3

(S) Draw a block diagram of fiber optical communication system and explain 4

UNIT—II

4. (A) Give the applications of radioisotopes. 4

(B) Define half life time. If decay constant of uranium is 0.0330 per year, determine its half life time. 4

(C) State the basic principle of radiometric dating. What are most common types of radiometric dating ? 4

OR

5. (P) Give a brief account of nuclear composition :

(i) Nuclear size

(ii) Nuclear spin. 4

(Q) Give the brief account of nuclear properties. 4

(R) What are the laws of radioactive disintegration ? Derive the relation $N = Noe^{-\lambda t}$. 4

UNIT—III

6. (A) What is ballistic ? What are different types of ballistics ? 4

(B) What is ballistic coefficient and sectional density ? 4

(C) Find out Barrel pressure from given data :

12 gauge slugger shotgun in which diameter of barrel is 0.729 inch, length of barrel is 21 inch, mass of projectile is 437 grains, velocity of projectile is 1694.75 FPS. 4

OR

7. (P) What is firearm ? What are different components of firearm ? 4

(Q) Explain any two methods of measurement of barrel pressure. 4

(R) What is recoil velocity ? Find out recoil velocity from given data :

0.22 Hornet (Handgun bullet)

Bullet weight is 37 grains, muzzle velocity is 2580 FPS, gun weight is 8 pounds. 4

UNIT—IV

8. (A) Explain the following terms :

(i) ISO number

(ii) Shutter speed

(iii) Aperture. 6

(B) Give a detail account on 36 mm film. 3

(C) What is photography ? Give types of forensic photography. 3

OR

9. (P) Write a report on questioned bullet (Q_1) and controlled bullet (C_1) found at crime scene. 4

(Q) What is DSLR camera ? Explain working of DSLR camera. 4

(R) Explain crime scene photography. 4

UNIT—V

10. (A) Derive equation for parabolic trajectory of a bullet. 4

(B) Explain Escape velocity and Terminal velocity. 4

(C) What do you mean by Air resistance and bullet drop ? 4

OR

11. (P) Explain casting and wind dylection. 4

(Q) Explain length effect of ricochet bullet and stability of flight after ricochet. 4

(R) Explain the following terms :

(i) Angle of incidence

(ii) Critical angle

(iii) Angle of ricochet. 4

UNIT—VI

12. (A) Give the brief account on compound microscope. 4

(B) Explain comparison microscope. 4

(C) What do you mean by microspectrophotometer ? 4

OR

13. (P) Explain transmission electron microscope. 4

(Q) Give the account on polarizing light microscope. 4

(R) Explain the following terms :

(i) Polarizer

(ii) Analyzer. 4